THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DANIEL J. CAPON and DAVID V. GOEDDEL

Appeal No. 94-3676
Application 07/949,327[1]

HEARING: April 9, 1997

Before GRON, Administrative Patent Judge, McKELVEY, Senior Administrative Patent Judge, and WEIMAR, Administrative Patent Judge.

GRON, Administrative Patent Judge.

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[1] Application for patent filed September 21, 1992. According to applicants, this application is a continuation of Application 07/749,371, filed August 23, 1991, now abandoned; which is a continuation of Application 07/104,461, filed October 2, 1987, now abandoned; which is a continuation-in-part of Application 06/438,128, filed November 1, 1982, now abandoned; which is a continuation-in-part of Application 06/355,298, filed March 8, 1982, now abandoned.

DECISION ON APPEAL UNDER 35 U.S.C. § 134

This is an appeal under 35 U.S.C. § 134 from an examiner's rejections of Claims 12-22, 24-28, 32, and 35.

1. Introduction

Claims 12-17, 24-28, and 32 stand rejected under 35 U.S.C. § 103 as unpatentable in view of the combined teachings of Yabrov, "Interferon and Nonspecific Resistance," Human Sciences Press, New York, NY, pp. 25-28 (1980), and Goeddel et al. (Goeddel), "The Structure of Eight Distinct Cloned Human Leukocyte Interferon cDNAs," Nature, Vol. 290, pp. 20-26 (1981). Claims 12-22, 24-28, 32, and 35 stand rejected under 35 U.S.C. § 103 as unpatentable in view of the combined teachings of Yabrov, Goeddel, and Nagata et al. (Nagata), "Synthesis in *E. coli* of a Polypeptide with Human Leukocyte Interferon Activity," Nature, Vol. 284, pp. 316-320 (1980). Claims 12-22, 24-28, 32, and 35 stand rejected under 35 U.S.C. § 103 as unpatentable in view of the combined teachings of Yabrov, Goeddel, and Ptashne et al. (Ptashne), U.S. 4,332,892, which issued June 1, 1982, from an application filed January 10, 1980.

Claims 29-31, 33, and 34 are also pending in this application but have been withdrawn from further consideration by the examiner as drawn to nonelected, restricted inventions. Because appellants' brief states that the claims stand or fall together, we elect to decide the merits of this appeal of the examiner's decision to reject the subject matter claimed on the basis of Claim 12. See 37 CFR § 1.192(c)(7). While all claims are said to stand or fall together (Appellants' Brief, p. 5), Claims 12, 17, 19, 20,[2] and 27 are reproduced[3] below:

> 12. An essentially purified and isolated DNA sequence encoding a polypeptide consisting essentially of the amino acid sequence of a non-human mammalian interferon.
>
> 17. Plasmid pBoIFN-α1-trp55.
>
> 19. A culture of transformant cells capable of producing non-human mammalian interferon in a form unaccompanied by the signal peptide or presequence peptide that is the immediate product of the translation of the mRNA

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[2] It is not apparent to this panel that the examiner has expressly determined the metes and bounds of the subject matter of Claims 19 and 20.

[3] We note that Claims 21 and 27 which are appended to Appellants' Brief have been incorrectly transcribed. Specifically, Claim 21 should refer to Claim 14, not "Claim 4" as indicated.
The final word "thereof" in Claim 27 should be --hereof--.

of said non-human animal interferon.

20. A process which comprises expressing a gene encoding a non-human mammalian interferon in a form unaccompanied by the signal peptide or presequence peptide that is the immediate product of the translation of the mRNA of said non-human animal interferon in a microorganism or cell culture.

27. An essentially purified and isolated DNA sequence encoding a non-human mammalian interferon having the amino acid sequence essentially as set forth in Figures 3a-d, 9a-c, 14a-e and 15 hereof.

Our reasons for including Claims 17 and 27 in the body of this decision should become apparent from the "Other Issues" portion of our opinion.

2. Discussion

Claim 12 is drawn to essentially purified and isolated DNAs which encode all amino acid sequences of non-human mammalian interferons. The examiner relies on Yabrov essentially for its teaching that "there are reports which show a high protective activity of bovine, rabbit and rat interferons for human cells (Babiuk, Rouse, 1977; Filipic et al., 1977)" (Yabrov, p. 26, first full para.). Goeddel identifies the structures of eight distinct cloned human leukocyte interferon cDNAs and, according to the examiner,

teaches "the genomic cloning of human IFN genes" (Examiner's Answer (Ans.), p. 3). The examiner concludes (Ans., p. 3):

> It would have been obvious for one of ordinary skill in the art to clone IFN genes from any non-human species since the non-human interferons were known (Yabrov) to be present in specific tissues and cells of animals, and the cloning methods using the known human DNA sequence to probe any mammalian library and recover an IFN species were known. Goeddel *et al*. uses such a procedure for other human IFN species and reports eight distinct species.

Nagata and Ptashne are cited as evidence that processes for isolating, purifying, cloning and expressing human IFN and various mammalian genes in a bacterial host were well-known in the art at the time appellants made their invention. Thus, the examiner finds that it would have been within the ordinary skill of the artisan to employ recognized techniques for isolating, purifying, cloning and expressing any mammalian IFN gene in a bacterial host in view of Goeddel's teaching of the structure of human leukocyte interferon and Yabrov's suggestion of some structural homology between heterologous mammalian interferons (Ans., p. 4).

Appellants argue that (1) the examiner's holding of unpatentability of the subject matter claimed herein under 35 U.S.C. § 103 is inconsistent with the precedent set in Amgen, Inc. v. Chugai Pharmaceuticals Co., Ltd., 927 F.2d

1200, 18 USPQ 1016 (Fed. Cir. 1991), (2) the prior art cited by the examiner does not establish a prima facie case of unpatentability under

35 U.S.C. § 103 for the claimed subject matter, and (3) the greater weight of all the evidence of record, including the Declarations of Michael Samuel Neuberger and A. Neil Barclay under 37 CFR § 1.132 and attached exhibits, favors patentability. The examiner argues that unpatentability is evident because

(a) all the means and methods for isolation, purification, cloning and expression of DNA encoding non-human mammalian interferons were available to persons having ordinary skill in the art at the time appellants' invention was made, (b) the evidence as a whole provides more than a mere invitation to try to identify and isolate DNA which encodes non-human mammalian interferons using probes based on cDNA which encodes human interferon, e.g., the examiner argues that Yabrov's teaching that bovine, rabbit, and rat interferons show activity on human cells and other corroborative studies of record (Ans., p. 5, l. 20, to p. 7, l. 7) reasonably would have suggested to persons having ordinary skill in the art that a high degree of homology exists between DNA which

encodes human interferons and DNA which encodes non-human mammalian interferon, (c) based on the evidence of record as a whole, persons having ordinary skill in the art reasonably would have expected success in isolating DNA which encodes non-human mammalian interferons using probes based on DNA which encodes human interferons, purifying the isolated DNA, cloning the non-human mammalian DNA in bacterial hosts, and expressing the DNA in bacterial hosts to synthesize non-human mammalian interferons, all without undue experimentation.

Based on the evidence in this record and the precedent of our reviewing court at the time the issues in this case were briefed, we reverse the examiner's holding. Moreover, in light of the more recent decisions in In re Bell, 991 F.2d 781, 785,
26 USPQ2d 1529, 1532 (Fed. Cir. 1993), and In re Deuel, 51 F.3d 1552, 1559, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995), which instruct that "a general method of isolating cDNA or DNA molecules is essentially irrelevant to the question whether the specific molecules themselves would have been obvious, in the absence of other prior art that suggests the claimed DNAs" (Id.), the examiner's error is apparent.

While appellants do not contest the examiner's finding that the prior art of record as a whole shows varying levels of heterologous activity among bovine, porcine, human, rabbit, monkey, equine, and canine (Ans., pp. 6-7, bridging para.),[4] they argue that the examiner's finding that "it would be **highly likely** bovine and human [DNAs which encode interferon] are significantly homologous in their primary structure (DNA and amino acid sequences)" (Ans., p. 7, l. 9-10) is speculative and contrary to the declaratory evidence of record. We find that while the evidence to which the examiner points does suggest some degree of homology between the interferon amino acid and DNA sequences which likely would provoke experimentation, we find that it is not sufficient to have reasonably led persons having ordinary skill in the art to expect success.

While Yabrov reports that bovine, rabbit and rat interferons show "a high protective activity . . . for human

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[4] We note the examiner's citation of other art. In re Hoch, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970):

> Where a reference is relied on to support a rejection, whether or not in a "minor capacity," there would appear to be no excuse for not positively including the reference in the statement of the rejection.

cells," the evidence of record does not establish that persons having ordinary skill in the art reasonably would have expected a high degree of structural homology among DNAs which encode human and non-human mammalian interferons without some prior knowledge of the comparative amino acid sequences of the human and corresponding non-human mammalian interferons. Absent that knowledge, the use of DNA which encodes human interferon to probe for DNA which encodes the corresponding non-human mammalian interferon would have been no more than "obvious-to-try". See In re Eli Lilly & Co., 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990):

> An "obvious-to-try" situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.

The examiner cites In re O'Farrell, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988) for the proposition that no more than a reasonable expectation of success is required for a holding of obviousness under 35 U.S.C. § 103 (Ans., p. 7). However, O'Farrell also instructs at 903, 7 USPQ2d 1681, that a suggestion is "obvious-to-try" when, as here, the "prior art gave either no indication of which parameters were

critical or no direction as to which of many possible choices is likely to be successful" or the "prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it" even though it would seem promising "to explore a new technology or general approach." Id.

The examiner appears to justify the holding of obviousness in this case in-part because appellants are said to have presented inconsistent arguments in response to earlier rejections under 35 U.S.C. § 112, first paragraph (Ans., p. 7, first full para.), now withdrawn. We suspect, based on statements in Deuel, that the examiner may have withdrawn the wrong rejection. See In re Deuel, 51 F.3d 1552, 1559, 34 USPQ2d 1210, 1216 (Fed. Cir. 1995):

> A general incentive does not make obvious a particular result, nor does the existence of techniques by which those efforts can be carried out.

However, at 1560, 34 USPQ2d at 1216, Deuel instructs:

> Because Deuel's patent application does not describe how to obtain any DNA except the disclosed cDNA molecules, claims . . . may be considered to be inadequately supported by the disclosure of the application.

Once the examiner conceded patentability under 35 U.S.C.

§ 112, first and second paragraphs, we are not surprised that little weight was given to the declarations of Drs. Neuberger and Barclay. The declaratory evidence appears to be inconsistent with the relative scope of enablement provided by the disclosures in appellants' prior applications, especially when comparing the scope of enablement in Application 07/104,461, filed October 2, 1987, to Application 06/438,128, filed November 1, 1982, in light of the intervening art (e.g., Higashi et al. (Higashi), "Structure and Expression of a Cloned cDNA for Mouse Interferon-β," J. Biol. Chem., Vol. 258, pp. 9522-9529 (1983); Leung et al. (Leung), "The Structure and Bacterial Expression of Three Distinct Bovine Interferon-β Genes," Bio/Technology, Vol. 2, pp. 458-464 (1984); and Capon et al. (Capon), "Two Distinct Families of Human and Bovine Interferon-α Genes Are Coordinately Expressed and Encode Functional Polypeptides," Molecular and Cellular Biology, Vol. 5, No. 4, pp. 768-779 (Apr. 1985)).

No evidence of record indicates that an amino acid sequence for any known non-human mammalian interferon had been determined let alone compared to that of human interferon before November 1, 1982, the filing date of Application

06/438,128. Accordingly, because there is no prior teaching of an amino acid sequence for any known non-human mammalian interferon in the cited references, there can be no suggestion of the probable structure of DNA likely to encode non-human mammalian interferon. Therefore, at best, persons having ordinary skill in the art may have been able to successfully probe for DNA which encodes non-human mammalian interferon with human leukocyte interferon cDNA with enough experimentation. Without providing guidance or direction, the prior art merely invites such experimentation. Unpatentability under 35 U.S.C. § 103 requires more information.

The examiner has the initial burden to establish a prima facie case of obviousness under 35 U.S.C. § 103. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988):

> The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. . . . It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

Even assuming a significant degree of homology between DNA which encodes human interferon and DNA which encodes non-human mammalian interferon, the evidence in this record reasonably would not have led persons having ordinary skill in the art to expect success without undue experimentation.

The examiner correctly states that absolute predictability of success is not required for obviousness. The prior art need not ensure success (Ans., pp. 8-9, bridging para.). We agree.

However, in our view, (1) the evidence cited in this case would no more than have invited persons having ordinary skill in the art to experiment with little or no guidance or direction, and (2) the claimed "essentially purified and isolated DNA sequence encoding a polypeptide consisting essentially of the amino acid sequence of a non-human mammalian interferon" (Claim 12) in essence stands finally rejected in view of "a general method of isolating cDNA or DNA molecules" which is essentially "irrelevant to the question whether the specific molecules themselves would have been obvious, in the absence of other prior art that suggests the claimed DNAs." In re Deuel, 51 F.3d at 1559,

34 USPQ2d at 1215. Accordingly, we must reverse the examiner's decision to reject the patentability of the claimed subject matter under 35 U.S.C. § 103 in view of the combined prior art teachings.

3. Other Issues

At Oral Hearing on April 9, 1997, this panel asked appellants' counsel, Mr. R. Love, (1) what information had been added to Applications 07/104,461, filed October 2, 1987, and 06/438,128, filed November 1, 1982, which was not explicitly described in their respective parent applications; (2) whether appellants were aware of any intervening art which could be material to the patentability of the subject matter claimed; and (3) whether the examiner had determined the effective filing date for the full scope of the subject matter of the appealed claims. Counsel understandably was not prepared to answer the questions presented at Oral Hearing, so the Board entered an Order dated April 9, 1997, requesting the information. Counsel timely responded with papers filed on April 11, 1997.

We note from the papers filed on April 11, 1997, that (1) Capon, "Two Distinct Families of Human and Bovine Interferon-α Genes Are Coordinately Expressed and Encode

Functional Polypeptides," Molecular and Cellular Biology, Vol. 5, No. 4, pp. 768-779 (Apr. 1985), which was published in 1985, (2) Leung, "The Structure and Bacterial Expression of Three Distinct Bovine Interferon-β Genes," Bio/Technology, Vol. 2, pp. 458-464 (1984), which was published in 1984, and (3) Higashi, "Structure and Expression of a Cloned cDNA for Mouse Interferon-β," J. Biol. Chem., Vol. 258, pp. 9522-9529 (1983), cited in Leung, which was published in 1983,[5] are intervening publications. To perfect their claim for priority under 35 U.S.C. § 120 and antedate the teachings of the aforementioned intervening publications, the specification of Application 06/438,128, filed November 1, 1982, must describe and enable one skilled in the art to make and use the full scope of the subject matter presently claimed. See In re Scheiber, 587 F.2d 59, 62, 199 USPQ 782, 784 (CCPA 1978):

> Section 120 . . . concerns only an applicant's effective filing date . . . and it expressly requires an earlier application to disclose the claimed subject matter in compliance with 35 U.S.C. § 112, first paragraph.

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[5] We have not actually retrieved the Higashi article. However, we are so excited by its title that we recommend that the examiner retrieve the article and consider the patentability of the subject matter claimed in this case over its teaching.

For further explanation, see In re Gosteli, 872 F.2d 1008, 1012,
10 USPQ2d 1614, 1618 (Fed. Cir. 1989)(The Board found that Gosteli's priority papers "did not provide a sufficient written description of the entire subject matter of [the] claims . . . as required by the first paragraph of section 112.")

The importance of Scheiber and Gosteli to this case is highlighted because we find that Application 06/438,128, filed November 1, 1982, does not describe the full scope of the DNA claimed in this application. Note, for example, that Claim 27 is explicitly directed to and appealed Claim 12 encompasses "[a]n essentially purified and isolated DNA sequence encoding a non-human mammalian interferon having the amino acid sequence essentially as set forth in Figures . . . 14a-e and 15 hereof." The "amino acid sequence" and corresponding DNA structure described in Figures 14a-e and 15 of this application do not appear in Application 06/438,128, filed November 1, 1982, i.e., Figures 14a-e and 15 appear for the first time in Application 07/104,461, filed October 2, 1987. As stated in a most recent decision in Regents of the Univ. Of

California v. Eli Lilly & Co., 119 F.3d 1559, 1566-67, 43 USPQ2d 1398, 1404 (Fed. Cir. 1997):

> An adequate written description of a DNA, such as the cDNA of the recombinant plasmids and microorganisms . . . "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for obtaining the claimed chemical invention. *Fiers v. Revel*, 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Accordingly, "an adequate description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself." *Id.* at 1170, 25 USPQ2d at 1606.

Citing Deuel and Bell, the court added, Id. at 1567-68, 43 USPQ2d at 1405-1406:

> Thus, *a fortiori*, a description that does *not* render a claimed invention obvious does not sufficiently describe that invention for purposes of § 112 . . . .
>
> . . . . .
>
> . . . [A] description of rat insulin cDNA is not a description of the broad classes of . . . mammalian insulin cDNA.
>
> . . . . .
>
> . . . In claims to genetic material . . . a generic statement such as . . . "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly

possessed by members of the genus that distinguish them from others.

We suggest that the examiner carefully consider whether the teachings of Higashi (1983), Leung (1984), and Capon (1985) are material to the subject matter appellants now claim. If the references are material, the examiner should determine the effective filing date of the claimed subject matter, i.e., the filing date of the earliest application which would have both described and enabled the full scope of the claimed subject matter, so to establish whether Higashi, Leung, and Capon are prior art with respect to the subject matter claimed. After considering the highlighted new matter in the various specifications of appellants' earlier applications (the highlighted prior specifications were filed April 11, 1997, in response to an Order entered April 9, 1997), we find that Application 07/104,461, filed October 2, 1987, is the first application to describe the amino acid sequences of rabbit and porcine interferons and the corresponding DNAs which encode those amino acid sequences. Therefore, the effective filing date of all claims which are directed to DNA which encodes rabbit and porcine interferons is October 2, 1987. That is not to say that the full scope of

the subject matter claimed in this case complies with the description and enablement requirements of 35 U.S.C. § 112, first paragraph, for all other DNA encompassed by the claims. For the most part, we leave the question of whether the present claims satisfy the requirements of the first paragraph of section 112 for the examiner to determine in the first instance. See In re Deuel, supra, and Regents of the Univ. Of California v. Eli Lilly & Co., supra, for instruction. Moreover, we remind the examiner that if Higashi, Leung, and Capon are material prior art with respect to the claimed subject matter, new grounds of rejection under 35 U.S.C. § 102 or 103 may very well be appropriate.

4. Conclusion

We reverse the examiner's decision to reject Claims 12-17, 24-28, and 32 under 35 U.S.C. § 103 as unpatentable in view of the combined teachings of Yabrov and Goeddel.

We reverse the examiner's decision to reject Claims 12-22, 24-28, 32, and 35 under 35 U.S.C. § 103 as unpatentable in view of the combined teachings of Yabrov, Goeddel, and Nagata.

We reverse the examiner's decision to reject Claims 12-22, 24-28, 32, and 35 under 35 U.S.C. § 103 as unpatentable in

view of the combined teachings of Yabrov, Goeddel, and Ptashne.

We remand this application to the examiner for further action consistent with the “Other Issues” raised herein.

This application, by virtue of its "special" status, requires an immediate action. Manual of Patent Examining Procedures § 708.01(d)(6th ed., rev. 3, July 1997). It is important that the Board be informed promptly of any action affecting the appeal in this case.

Reversed and Remanded

Teddy S. Gron Administrative Patent Judge	)	
Fred E. McKelvey, Senior Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
Elizabeth C. Weimar Administrative Patent Judge	)	

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